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A MANAGEMENT APPROACH DESIGNED TO RESOLVE PROBLEMS IN PARIA CANYON

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ABSTRACT

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TITLE: A Management Approach Designed To Resolve Problems In Paria Canyon

ABSTRACT: The Paria Canyon-Vermilion Cliffs Wilderness is a 110,000 acre area located within southern Utah-northern Arizona, and is administered by the Bureau of Land Management.

Managers are facing management problems within the Paria Canyon portion of the Wilderness brought on by increasing visitation and high-impact recreational user practices.

The intent of this project is to present a management approach designed as a reference guide to aid managers in the selection of management actions for the canyon. The management approach recommends several information dissemination schemes, management strategies and tactics as techniques to help resolve use problems in the canyon.

Keywords: Information Dissemination Schemes, Management Approach, Strategies, Study, Summary, Tactics

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EXECUTIVE SUMMARY

Title: A Management Approach Designed To Resolve Problems In Paria Canyon

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Summary: An increase in visitor use in the Paria Canyon portion of the Paria Canyon-Vermilion Cliffs Wilderness has brought on an array of management problems for Bureau of Land Management wilderness managers. Managers are concerned that the increase in litter, human waste, campsite deterioration, and trailing will result in resource damage and loss in the quality of wilderness experiences.

The objective of this project is to provide wilderness managers and specialists with specific informational guidance that will aid in their efforts to resolve management problems in Paria Canyon.

A two-part management approach consists of the project results. This two-part approach was developed based on wilderness legislation and regulations, user information, and the review and examination of previous wilderness research.

The management approach comprises a range of strategies, tactics and information dissemination schemes designed as a reference tool to aid managers in the selection of administrative actions for Paria Canyon.

Recommendations are made for the development of a marketing/interpretive plan for Paria Canyon and suggestions are given for future wilderness research projects.

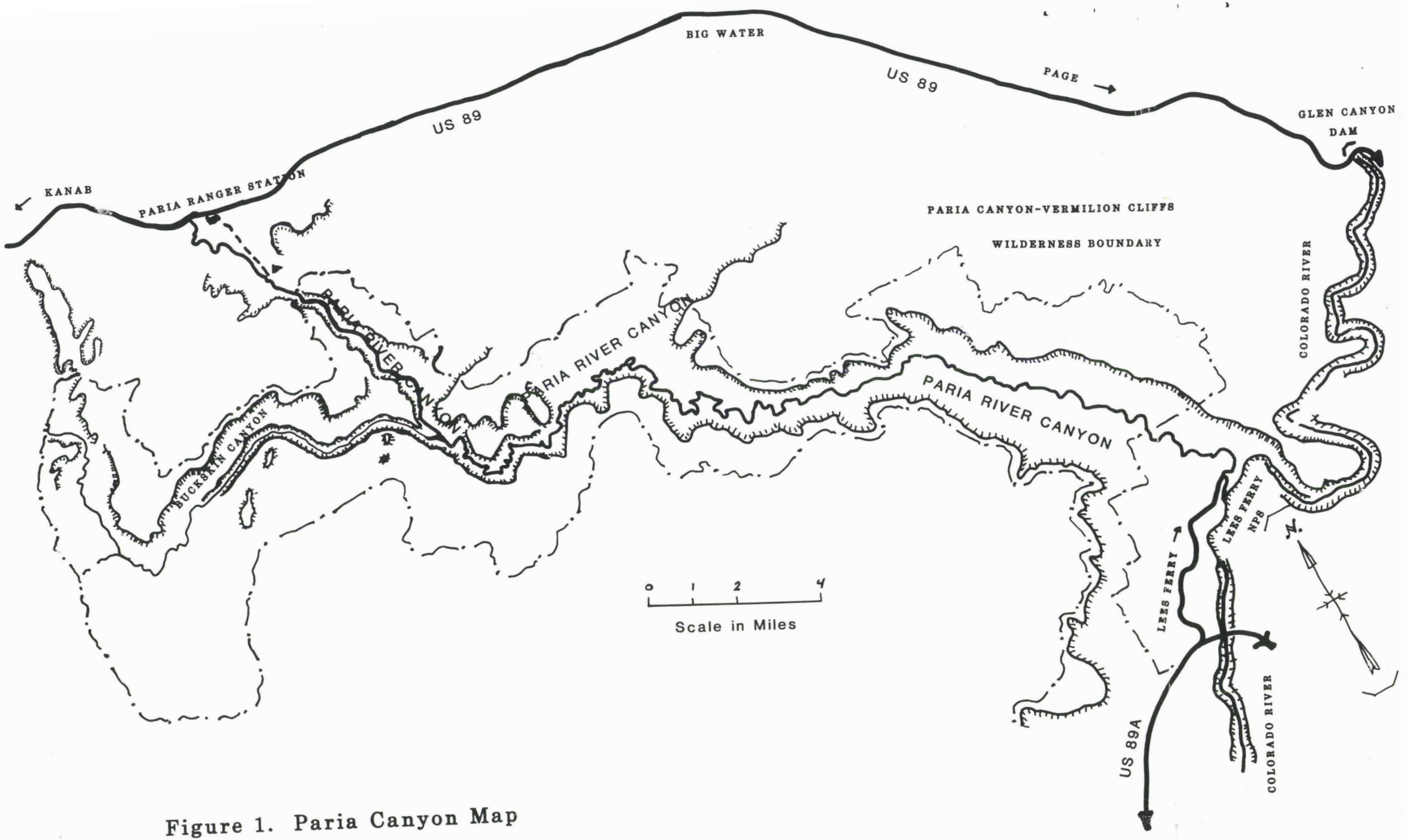

Figure 1. Paria Canyon Map

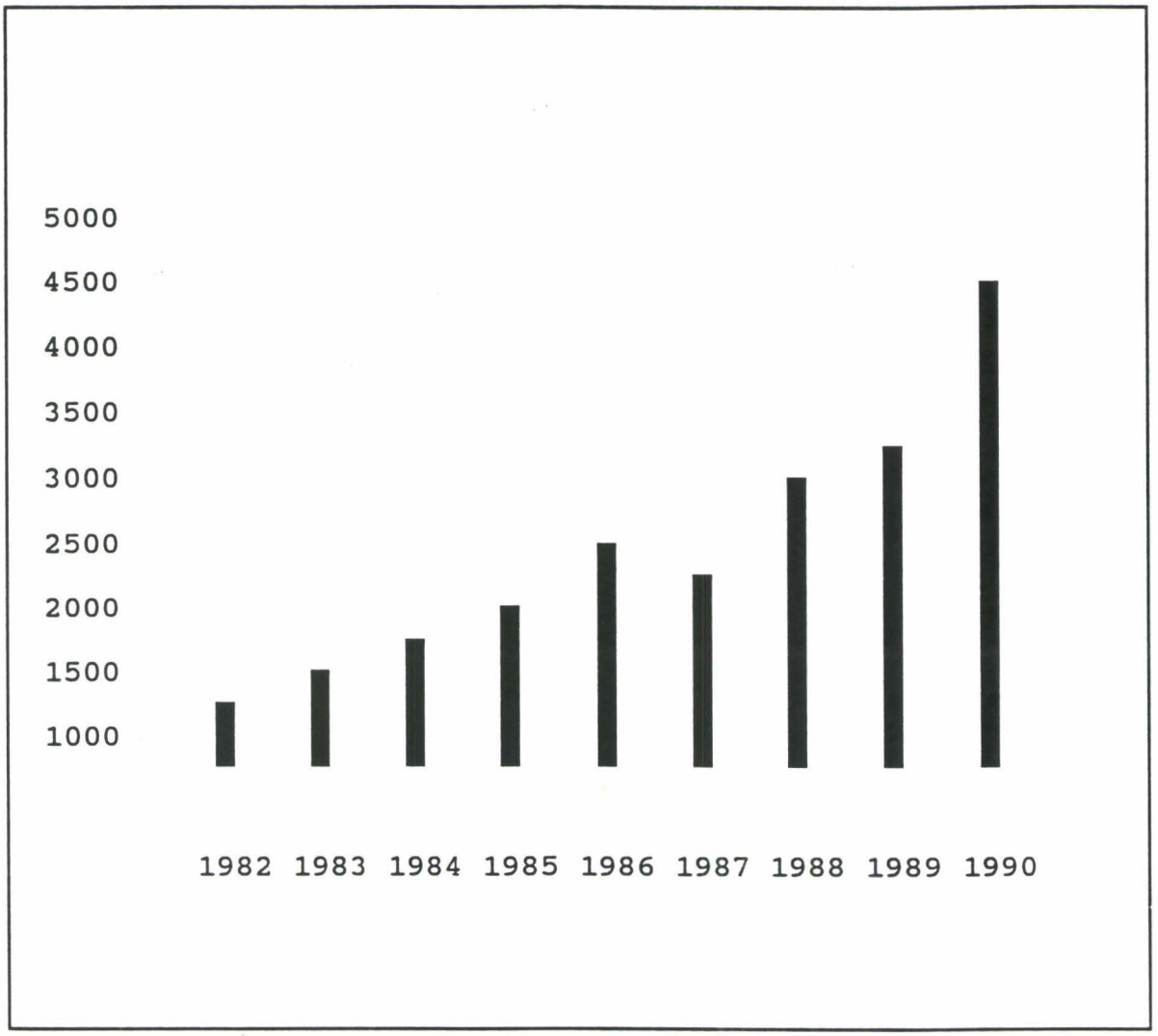

Figure 2. Paria Canyon Visitor Use

CHAPTER I

PARIA CANYON

Introduction

The Paria Canyon-Vermilion Cliffs Wilderness was designated in 1984 as part of the Arizona Wilderness Act. Encompassing 110,000 acres within southern Utah and northern Arizona, the area is jointly administered by the Bureau of Land Management's (B.L.M.'s) Vermillion Resource Area (Arizona Strip District) and the Kanab Resource Area (Cedar City District).

The predominant feature of the wilderness area is the 35-mile-long Paria Canyon (see Figure 1). This 2500-foot-deep canyon is known for its geological, historical, biological, cultural and scenic values. It has also become well known for its backcountry and wilderness experience opportunities, making the Paria Canyon both a nationally and internationally significant recreation area. Because of this recognition of its scenic beauties, use levels have increased threefold in the last nine years (see Figure 2).

"Ironically, the greatest threat to the public's continued freedom of access to wilderness may be the ever growing number of persons who are seeking wilderness experiences" (Bultena et al. 1981:298).

Certainly increased use of Paria Canyon has resulted in increased litter, human waste, campsite deterioration and trailing. The B.L.M. managers and wilderness specialists who are responsible for managing the area, are concerned that these

problems will result in the deterioration of the wilderness resource and a reduction in the quality of visitors' wilderness experiences.

Because of resource damage and a possible loss in the quality of wilderness experiences, managers face the need to explore ways by which management can mitigate these problems and develop possible solutions. Photo documentation (see Appendix A) shows the unique qualities of the canyon and the types of user problems facing management.

Purpose

The purpose of this research project is to provide the managers and wilderness specialists with a management approach which offers techniques and practices designed to resolve the sociological and ecological problems in the canyon.

One basic idea for this approach is to utilize the backcountry user's opinions concerning management problems in Paria Canyon. A study conducted on the Mount Jefferson Wilderness supports this particular approach in identifying and utilizing visitors' opinions of the quality of wilderness management in particular areas. That study concluded that "managers need to consider factors such as legal mandates, management objectives and their greater knowledge of the area and its ecology, but information about visitors' standards should contribute to better management decisions" (Shelby et al. 1988:254).

Therefore, the proposed management approach is based not only upon wilderness legislation and regulations, but also upon user attitudes toward existing management of the area.

The results present a management approach in a reference guide format designed to aid managers and wilderness specialists with the selection of management practices for the canyon. The first part of the guide presents information dissemination schemes which address ways to educate the visitor about low-impact practices and wilderness ethics. The schemes focus on informing visitors prior to their entering the wilderness area.

The second part of the proposed management approach defines management strategies that identify the primary causes of the problems occurring in the canyon and a range of management tactics designed to resolve these problems. This approach "focuses on the belief that management problems are more easily resolved when management combines education, dissemination of information, regulations and possible site manipulation" (Cole et al. 1987:4).

Need

The management of Paria Canyon goes beyond the day to day operations of registering hikers, answering questions about the area and patrolling the boundary. Wilderness managers are faced with the task of bringing into balance recreational use in the canyon and the protection of the wilderness resource.

Accordingly, the resource area managers and wilderness specialists must develop effective ways to deal with this complex management issue.

Developing actions to deal with the issue is a lengthy and intricate process as it requires a great deal of research and assessment of information. Hence, any means that can contribute to this process will be of value.

This project provides managers with an action plan designed to aid in the management of Paria Canyon. Therefore, the objectives of this field project are:

1. To present suggested management strategies and tactics to be used in resolving both sociological and ecological problems in Paria Canyon.
2. To provide recommendations for disseminating information to visitors so that they will behave in ways that produce the least impact on Paria Canyon resources.
3. To identify implementable actions that, when carried out, will educate visitors on appropriate wilderness ethics.

CHAPTER II

LITERATURE REVIEW

Understanding wilderness users and their perceptions and desires plays a critical role in the management of wilderness. Perhaps Hendee, Stankey, and Lucas phrased it best, "...understanding wilderness use and the users is an essential foundation for any decisions about wilderness management" (qtd. in Lucas 1989:41).

Research studies done on wilderness users play an important role in identifying visitors' perceptions of management and revealing their expectations of the area.

During the summer of 1975, Brown and Haas conducted a study in the Rawah Wilderness of Colorado to define the type of experience users sought in terms of psychological outcomes.

The intent of the study was to help wilderness managers gain better perceptions of the users' wants and needs, thus providing information that will aid in the management of wilderness areas.

Registered party leaders who visited the wilderness during the 1975 season were sent a three-part questionnaire. The questionnaire focuses on the way certain items added or detracted from the users' wilderness experiences.

The researchers categorized the 164 respondents into five groups, given their responses to the questions. The user groups ranged from the traditional (as defined by wilderness research) to the users who are beginners to wilderness recreation.

Distinguishing characteristics were exhibited by each of these groups. One group expressed little concern for solitude and isolation, while another evidenced more of an acceptance to off-site management actions for regulating use. However, almost all of the users' desires focused on nature, escaping everyday pressures and the freedom of time and movement (Brown and Haas 1980).

The researchers did recognize the limitations of the study in using a sample that only consisted of party leaders from the trailhead registers. This limited source does not indicate the preferences of all visitors. Because of this limitation the researchers did not generalize the users and therefore, made no firm management perscriptions (Brown and Haas 1980).

The researchers concluded in their study that the "information on the psychological outcomes sought by recreationists and on the types of recreationists pursuing specific activities in specific areas can be useful to planners and managers." The areas in which this information could be used would be for developing visitor information programs, appropriate management objectives and practices (Brown and Haas 1980:229-241).

Mt. McKinley National Park is one of the most regulated backcountry use areas in the National Park system. Camping zones, a first-come-first-serve permit system, wildlife closures, restrictions on the location of campsites and the exclusion of campfires are all use limitations placed on backpackers.

A study of potential visitors to the park was conducted in 1978, to "examine the conflict between preserving personal freedom in wilderness use and the implementation of administrative controls to protect wilderness values" (Bultena et al. 1981:299).

Some 4,000 visitors responded to the pre-trip questionnaire. The questions were geared toward the users' support or non-support of existing regulations and various rationing schemes for controlling use in the backcountry.

The objective of the questions was to assess the backpackers' attitudes toward the rationing of use in the backcountry and management policies in the park. The questionnaire is designed to determine if the hikers' views are associated with their wilderness preferences, such as solitude and recreational developments.

Interestingly enough, the researchers predictions were realized as the hikers who were most development oriented were the least supportive of rationing and restrictive use controls (Bultena et al. 1981).

The final analysis of the study indicates that the potential visitor generally supports the park's current rationing scheme and the backcountry policies. Furthermore, those users who seemed to be the most committed to obtaining solitude in their forthcoming visit were most opposed to recreation development within the backcountry.

Robertson conducted a study in the Three Sisters Wilderness in Oregon, designed to show a relationship between visitor

behavior, attitudes and knowledge of appropriate skills (Robertson 1981).

Utilizing a roaming technique, Robertson contacted 216 parties at predetermined locations in the wilderness area during the summer of 1980. The parties were given a four part questionnaire that asked about their knowledge and skills of campfire building, human waste and wash water disposal, and habits in wood gathering. Also, the parties were asked about their attitudes toward wilderness.

The respondents were placed into two groups based upon the results. The researcher found that "those persons who scored high on the knowledge scale also tended to score high on the behavior scale. In turn those who scored low on knowledge also scored low on behavior" (Robertson 1981:50).

Based on the findings from the study, the researcher concluded that information holds significant value for wilderness recreation management.

It was determined that the need for regulatory management practices such as rules governing length of stay, group size, area of use, and specified camping locations would be lessened if the users' knowledge of appropriate behavior and skills is increased (Robertson 1981).

Although all three studies focused on obtaining different information about the wilderness user, the commonality of each was intended to aid managers in directing administrative decisions and in selecting appropriate actions for wilderness areas.

CHAPTER III

METHODOLOGY

The management approach consists of two techniques designed to resolve and control the problems in Paria Canyon. The first is *dissemination of information* to educate the visitor about behavior that will lessen adverse impacts on the wilderness resource. The second employs a range of *tactics* designed to mitigate recreational impacts in the canyon brought on by improper human waste disposal, multiple trailing and the trampling of vegetation (see Appendix A).

The development of this approach is based on my knowledge of the existing use in Paria Canyon, visitor registration comments, a review of similar wilderness research, and information from the Paria Canyon Study Summary (see Appendix B).

Educating the visitor can produce a long-lasting, positive effect which may benefit not only Paria Canyon, but other public lands as well. This argument is based on the idea that "wilderness education will increase public awareness about wilderness, affect attitude and behavior changes that will protect wilderness values, and develop a general outdoor ethic" (Ideas 1989:1).

The *information dissemination schemes* are designed to provide the managers with a step-by-step guide which offers a variety of options for implementing educational information to visitors.

The *information dissemination schemes* identify the primary audience to target for education. Known users of Paria Canyon

provide the source for the target audience.

It must be recognized that B.L.M. records indicate that organized youth and non-youth groups who visit the canyon often promote negative comments from other users concerning their behavior. It is safe to state that these groups usually contain a number of visitors who have little, if any, knowledge of low-impact behaviors. "People cannot be expected to act properly if they are not informed as to what is appropriate behavior" (Ideas 1989:1). Therefore, the proposed *information dissemination schemes* targets all visitors, but primarily focuses on reaching the first-time visitor and/or organized groups prior to their visiting the canyon.

Not only is it imperative to define the target audience, but just as significant is the information to be disseminated. The rules and regulations governing the canyon make up one *information dissemination scheme*. The regulations were imposed to help maintain the integrity of the canyon's wilderness resources.

Another *information dissemination scheme* suggests marketing strategies and information disseminating tactics designed to get the information to the visitor. In order for the education process to be effective, efforts must be strategically implemented. The kind of information and presentation, as well as when the information is presented to the visitor, are components which must be considered.

Information dissemination schemes stress that the best time to present the information to visitors is prior to their arrival at Paria Canyon. This concept was taken from Lucas who feels that "information must be delivered early enough in the

recreation location choice process to be of use to visitors. After people have arrived at an access point, it is too late to influence that trip, although later trips might be affected" (Lucas 1981:12).

"The kind of information and how it is presented is a major component to disseminating information as it can significantly influence visitors' behavior" (Hahn 1982:13). Therefore, it is important to first establish what kind of information to disseminate to the visitor.

The primary source of canyon information for the visitor has been the Paria Hiker's Guide. Although it does present the rules and regulations of the canyon, there is significant room for improvement.

It is evident that in order for this information campaign to succeed, it cannot rely entirely on written material (Lucas 1981). Therefore, other forms of information are presented in the *information dissemination schemes*. On-the-ground presence of employees at the trailheads and in the canyon is encouraged in order to establish verbal communication with visitors. The most auspicious time for information exchange to occur is during the planning stages of their trips. One way to meet this need is to develop a slide presentation as part of a "visitor outreach program".

The visitor contact station has been a vital point of contact in the dissemination of information about Paria Canyon. The construction of a new visitor contact station at the northern entrance of the canyon provides another opportunity to display educational and informational material. This is seen as a

critical component of the new information dissemination schemes for Paria Canyon.

The proposed *information dissemination schemes* do not provide the consummate solutions for Paria Canyon, but previous studies have shown the positive effects of using information as a management tool (Hahn 1982).

The objective of this second technique which presents *strategies* and *tactics*, is to provide managers with a guide and/or reference tool that will aid in the selection of the most effective measures for dealing with management problems in Paria Canyon.

The *strategies* present a broad approach to management designed to attack the basic causes of the problems in the canyon (Cole et al. 1987). Three distinct problems have been identified in the canyon. The sociological and ecological problems that are appearing in the canyon are caused by numbers of people visiting the area. The reduction of use in the canyon is proposed as one strategy which would address this problem.

The most obvious problems identified in the canyon are those associated with unacceptable visitor behavior, resulting from high-impact use in the canyon. Modification of these negative behaviors through education is the second approach proposed for resolving problems in the canyon.

The third proposed strategy is the rehabilitation and reclamation of areas in the canyon that are being degraded because of high-impact visitor use.

With the strategies identified, the focus can turn to development of tactics. "Tactics is the term used for a specific

means or tools available for implementing a strategy" (Cole et al. 1987:10).

One question arising in respect to the use of tactics is whether to develop a rather authoritarian or a lighter, more democratic approach. The advantages of the democratic approach include user satisfaction. Everyone enjoys freedom to do as one pleases and the costs of administering are low. The disadvantage is that the chances of obtaining the desired result are not high.

The selected approach proposes a number of tactics for each strategy, ranging from light-handed management practices which impose very few restrictions on the visitor and allows freedom of recreational choice, to restrictive management practices that require onsite management presence and restricts the visitors' freedom of recreational choice.

This reference guide provides a range of tactics from which to choose. It becomes most effective when several of the strategies and tactics are used together (Cole et al. 1987).

The method not only proposes a combination of strategies and tactics, but includes an analytical account of what managers and wilderness specialists must address when implementing the selected management practices. The breakdown addresses the impacts that may occur to visitors, a description of the action, funding/staffing considerations, a description of the problem and actions to be taken and suggestions on when to implement the actions.

CHAPTER IV

RESULTS

This field project presents recommended strategies and tactics and informational dissemination schemes, which formulate a managememt approach designed to help resolve problems in Paria Canyon.

Management Approach

The information dissemination schemes and a range of management strategies and tactics combine two methods which could control the problems in Paria Canyon caused from high-impact visitor use.

The *Information Dissemination Schemes* are the result of methods which focus on developing and implementing education information to the Paria Canyon visitor. The idea behind the information schemes is that visitors need to be educated about low-impact recreational practices and appropriate wilderness behavior prior to, and during, their visit in Paria Canyon.

Such actions are considered preventative measures that will help to reduce the problems in the canyon brought on by high-impact recreational use and inappropriate wilderness behavior.

The *Management Strategies and Tactics* provides managers with a menu-type of guide that presents a range of management practices designed to provide managers with a range of management tactics that present management practices of varying degrees. Light-handed tactics provide the visitor with the freedom of choice and employ little, if any, continual management presence.

The most restrictive and heavy-handed practices limit the visitors' choices and employs some type of continual management presence. This range provides managers with a variety of choices in solving the user problems in the canyon.

INFORMATION DISSEMINATION SCHEMES

SCHEME I. LOW-IMPACT PRACTICES SPECIFIC TO PARIA CANYON AND APPROPRIATE WILDERNESS BEHAVIOR

TARGETED INFORMATION

Waste disposal for a river system in a desert environment
Trail selection and use
Campsite selection
Traveling techniques off trail
Party size
Bathing and dishwashing techniques

COORDINATION

Resource area managers and wilderness specialists should define and agree to proper low-impact techniques

A low-impact message for staff who answer Paria Canyon inquiries should be devised

Uniformity in visitor information between the Arizona Strip and Cedar City Districts, and the Kanab and Vermilion Resource Areas must be established

MARKETING STRATEGIES

Provide an educational and informational wilderness message about low-impact practices and appropriate behavior

Provide the visitor with the social and/or ecological explanation for a particular low-impact technique or behavior

Increase efforts to communicate verbally with visitors:

Target visitors who provide advance notice of their intended trips:

* First time visitors

* Large organized groups (Boy Scout troops, organized hiking clubs, school groups)

* Return visitors

Visitors should be contacted at the trailheads, campgrounds, and the Paria Contact Station

INFORMATIONAL TACTICS

Revise the Paria Hiker's Guide

- Provide detailed information on low-impact practices and appropriate behavior specific to the canyon

Develop a low-impact pamphlet specific to Paria Canyon

Develop an aggressive "Outreach Program" for organized groups

- Provide written information, verbal presentations and slide shows
- Target such groups as Boy Scout troops, college classes and organized hiking clubs

Increase evening visitor contact at the trailhead campgrounds

Increase evening visitor contact at trailheads

Develop displays for the new Paria Contact Station

Construct informational kiosks at trailheads

- At Lees Ferry provide a message of thanks to the visitor for practicing low-impact camping

Develop volunteer program designed specifically to provide one-on-one contact with visitors to relay low-impact messages

RESOLUTIONS

Reduce degradation of the natural features of the canyon

Reduce trailing

Stabilize and/or reduce campsites

Reduce impacts from improper waste disposal

Reduce litter in the canyon

Reduce water pollution

Ensure opportunities for solitude

SCHEME II. EXISTING RULES AND REGULATIONS FOR PARIA CANYON

TARGETED INFORMATION

Maximum group size limit
Pack-in, pack-out policy
Campfire policy
Registration policy
Pet restrictions
Human waste disposal
Protection of cultural and natural resources
Motorized vehicle/mechanical transport closure

COORDINATION

Resource area managers and wilderness specialists need to identify and define new regulations and update existing ones to better reflect low-impact practices (i.e., change in maximum group size and waste disposal practices)

These people must then coordinate changes with staff members who will provide Paria Canyon information to public

MARKETING STRATEGIES

Provide educational information regarding rules and regulations for the canyon

Provide the social and/or ecological explanation for the rules and regulations

Increase efforts to communicate verbally with visitors about the existing rules of the canyon

Target visitors who provide advance notice of their intended trip

* First time visitors
* Organized groups (Boy Scout troops, hiking clubs, school groups)
* Return visitors

Target visitors contacted at the trailheads, campgrounds, and the Paria Contact Station

INFORMATIONAL TACTICS	Revise the Paria Hiker's Guide
	Display rules and regulations within creative, eye-catching messages
	Increase evening visitor contact at the trailhead campgrounds to review rules and regulations
	Increase visitor contact at trailheads
	Develop a display for the new Paria Contact Station
	Design rules and regulations message for prospective trailhead kiosks
RESOLUTIONS	Reduce degradation of the canyon's natural features and pristine qualities
	Reduce impacts to campsites
	Reduce impacts from improper waste disposal
	Reduce litter in the canyon
	Ensure opportunities for solitude

SCHEME III. SPECIAL FEATURES OF PARIA CANYON

TARGETED INFORMATION

Spring locations (water availability)
Cultural sites (petroglyph panels)
Wrather Arch
Judd Hollow pumping station
The Hole
Bush Head Canyon
Buckskin Gulch
Wilson & Spencer Ranches
Adam's Trail

COORDINATION

Resource area managers and wilderness specialists should define information developed about special features

These people should develop a plan for minimizing impacts caused by increased visitation to the areas (vandalism, trailing)

INFORMATIONAL TACTICS

The revised Paria Hiker's Guide:

- A detailed map identifying spring locations and special features of the canyon
- A written description of the features to correspond with the map

More information in Paria Canyon informational packets

An educated staff to inform visitors about the canyon's special features and water sources

A display for the new Paria Contact Station

- Make informative, but keep the wilderness ambiance of the canyon

A location map at the trailheads

RESOLUTIONS

Promote knowledge of spring sources and availability of drinking water

Increase wilderness experience by providing better opportunities for viewing special canyon features

STRATEGIES AND TACTICS

STRATEGIES FOR SOLVING PROBLEMS

I. **DISSEMINATE AND/OR REDUCE USE IN THE WILDERNESS PORTION OF PARIA CANYON** - "This strategy is associated with the notion that each area has a carrying capacity. The idea behind this strategy is that adverse impacts on ecosystems and visitor experiences result from excessive use and can be mitigated by reducing use" (Cole et al. 1987:2).

II. **MODIFY TYPE OF USE AND VISITOR BEHAVIOR** - Parties that do not practice low-impact behavior will cause more problems than parties that do practice low-impact behavior. Use and behavior can be modified so that the use that does occur is less likely to cause problems (Cole et al. 1987).

III. **PRACTICE RESOURCE REHABILITATION AND RECLAMATION** - This strategy involves rehabilitation and reclamation of resources through the manipulation of vistors' impacts and by the dissemination of information to visitors. These efforts primairly affect heavily impacted campsites and trails.

STRATEGIES AND TACTICS FOR WILDERNESS MANAGEMENT

I. **Reduce use in the wilderness portion of Paria Canyon**
   1. Encourage use during traditionally slow periods
   2. Limit or reduce group size from 15 to 10
   3. Limit numbers in the canyon during peak periods
   4. Limit number of groups in the canyon per day (implement a permit system)

II. **Modify the type of use and visitor behavior**
   1. Disseminate more information about wilderness ethics, low-impact practices and behavior
   2. Implement more restrictive regulations prohibiting certain practices
   3. Require knowledge of wilderness behavior and skills

III. **Practice resource rehabilitation and reclamation**
   1. Rehabilitate essential trails, scarify and obliterate non-essential trails.
   2. Close off campsites through information dissemination
   3. Sign closed campsites and trails

STRATEGY I. REDUCE USE IN THE WILDERNESS PORTION OF PARIA CANYON

TACTIC 1: ENCOURAGE USE DURING TRADITIONALLY SLOW PERIODS

DESCRIPTION OF PROBLEM	The perception of overcrowdedness in the canyon is brought on by physical contact with numerous parties and groups.
DESCRIPTION OF ACTION	Through written and verbal (telephone and person-to-person contact) communication, B.L.M. personnel will encourage visitors to plan their trips during the slower use periods.
PURPOSE	Reduce adverse social impacts brought on by overcrowding.
IMPACTS TO VISITORS	The results of the action would positively affect the visitors' wilderness experience.
FUNDING/ STAFFING CONSIDERATIONS	Current wilderness management staffing is below standard and not able to implement the proposed action effectively. Filling the now vacant Paria Ranger position will bring the wilderness management staff up to standard and allow for the implementation of this action.
IMPLEMENTATION	This tactic could be implemented immediately.

TACTIC 2: REDUCE GROUP SIZE

DESCRIPTION OF PROBLEM

Large party size tends to be a source of conflict with other visitors. Larger parties tend to create more noise, which conflicts with visitors' desire for solitude.

DESCRIPTION

Reduce the maximum group size limit from 15 to 10 people.

PURPOSE

Reduce ecological impacts to the wilderness resource by reducing the need for visitors to create larger camping areas.

Reduce conflicts for visitors who consider large parties undesirable and inappropriate for wilderness areas.

IMPACT TO VISITORS

The results of the action would positively affect the visitors' wilderness experience.

The reduction of the maximum group size limit would put limitations on organized groups who generally travel in large numbers, i.e., Boy Scout troops, educational groups, photography clubs and youth groups. These groups could be encouraged to use other less sensitive/unregulated B.L.M. areas.

FUNDING/ STAFFING CONSIDERATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed actions. To fully implement the recommended actions would require an increase in personnel and funding for the wilderness program. The recommended action would require increased patrols of the area and visitor contact to make sure that the group size limit is enforced.

The reduction of the maximum group size may require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan.

Such an amendment would require additional funding to implement.

IMPLEMENTATION

Determine if the action will require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan and/or public review.

Incorporate group size limit in displays for the new Paria Contact Station and trailhead interpretive kiosks.

Utilize news releases and correspondence to hiking clubs, Boy Scout groups and past commercial permit holders. Information should be incorporated into a revised Paria Hiker's Guide.

TACTIC 3: LIMIT NUMBERS DURING PEAK USE PERIODS

DESCRIPTION OF PROBLEM

During holiday periods and weekends, overcrowded conditions exist within the canyon. During these times, established campsites become scarce and visitors have a tendency to to create new campsites. Also, waste and litter increases during these periods. Implement a permit system during this period.

DESCRIPTION OF ACTION

Allow only a limited number of visitors in the canyon during the traditionally peak use periods, i.e., Easter week, Memorial Day weekend, Labor Day weekend. Establish a permit system during these time periods.

PURPOSE

Reduce social and ecological impacts on the canyon.

* Reduce the need for visitors to create new campsites
* Prevent overcrowded conditions from occuring in the canyon
* Reduce impacts from increased wastes and litter

IMPACT TO VISITORS

The results of the action would positively affect the visitors' wilderness experience.

FUNDING/ STAFFING CONSIDERATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed actions. To fully implement the recommended actions would require an increase in personnel and funding for the wilderness program. The recommended action would require increased patrols of the area and additional personnel stationed at trailheads to enforce the permit system. There would also be additional costs associated with issuing special permits during these limited periods.

The implementation of this action may require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan which would, in turn, require additional funding.

IMPLEMENTATION

Determine if this action will require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan and/or public review.

Present the information in a revised Paria Hiker's Guide.

Post special notices at the trailheads and in the Paria Contact Station one hiking season prior to implementation.

Utilize news releases and correspondence to hiking clubs, Boy Scout groups and past commercial permit holders. Information should be incorporated into a revised Paria Hiker's Guide.

TACTIC 4: LIMIT NUMBER OF GROUPS ENTERING THE CANYON PER DAY

DESCRIPTION OF PROBLEM

This management action would be implemented when the conditions in the canyon are close to reaching or have reached the "limits of acceptable change". This action would directly target adverse impacts from waste and litter, the degradation of existing campsites and increases in new campsites, overcrowded conditions, and excessive trailing.

DESCRIPTION OF ACTION

Restrict the number of groups entering the canyon per day through implementation of a permit system and establishment of a quota. The system would require visitors to obtain a permit before entering the canyon. A system for allocating permits would have to be established.

PURPOSE

To limit total use in the canyon so that social and ecological impacts from visitors are reduced.

IMPACT TO VISITORS

The results of the action would positively affect the visitors' wilderness experience.

Some inconvenience would result for visitors who may want to hike the canyon. A permit system could reduce their freedom of choice and require additional advance planning.

FUNDING/ STAFFING CONSIDER-ATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed actions. To fully implement the recommended actions would require an increase in personnel and funding for the wilderness program. The recommended action would require increased patrols of the area, and additional personnel stationed at trailheads to enforce permitting. There

would also be additional costs associated with the training of personnel and the administering of the permits, as a reservation system would be implemented.

The implementation of this action may require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan, which would, in turn, require additional funding.

IMPLEMENTATION

Investigate areas that have an established permit system in place. From this, define what type of system would best fit the Paria Canyon-Vermilion Cliffs Wilderness.

Determine if this action will require an amendment to the Paria Canyon-Vermilion Cliffs Wilderness Management Plan and/or public review.

Implement when previous actions have failed and the canyon is close to reaching the "limits of acceptable change".

Limit the distribution of permits to one Resource Area to reduce costs and require less coordination of visitor scheduling.

Prior to implementing any type of permit system develop a strategy plan which will cover:

*Information dissemination
*Permitting
*Enforcement

STRATEGY II. MODIFY TYPE OF USE AND VISITOR BEHAVIOR

TACTIC 1: DISSEMINATE MORE INFORMATION ABOUT WILDERNESS ETHICS, LOW-IMPACT PRACTICES AND BEHAVIOR

DESCRIPTION OF PROBLEM

Improper disposal of waste in the canyon has the potential for becoming a problem.

Improper behavior of visitors in a wilderness setting is occurring.

Degradation of the wilderness resource by visitors has the potential of becoming a problem.

DESCRIPTION OF ACTION

Resource Area staff would communicate proper behavior and low-impact practices in written correspondence as well as verbally.

The staff would develop additional brochures on low-impact practices specifically designed for Paria Canyon.

A revised Paria Hiker's Guide would specifically address:

* Proper waste disposal regulations
* Proper camping techniques
* Trailing
* Proper wilderness behavior

The new Paria Canyon - Vermilion Cliffs Wilderness Contact Station would provide:

* Low-impact camping displays
* Wilderness ethic displays
* Provide public contact

Provide additional ranger contact by increasing patrols in the canyon and at the trailheads.

Construct interpretive displays at the trailheads.

PURPOSE

To promote a better understanding of wilderness.

To change visitor behavior to reduce social and ecological impacts to the wilderness resource.

IMPACTS TO VISITORS

Impacts would be positive by providing visitors with lifelong skills and by instilling a wilderness ethic.

FUNDING/ STAFFING CONSIDERATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage for the proposed actions. To fully implement the recommended actions would require an increase in personnel and wilderness funding. The utilization of volunteers could provide some relief for additional staff, but should not be considered as a substitution for hiring full-time staff.

IMPLEMENTATION

Verbal and written communication of low-impact practices could be directed to hikers. This is an action that could be implemented immediately, which would reduce the limited amount of adverse impacts before the increase.

A marketing plan/interpretive plan could be developed to address the problem. The results would be:

* A revised Paria Hiker's Guide
* A low-impact camping brochure or pamphlet

TACTIC 2: IMPLEMENT MORE RESTRICTIVE REGULATIONS PROHIBITING CERTAIN PRACTICES

DESCRIPTION OF PROBLEM

Improper disposal of waste in the canyon.

Improper behavior of visitors in a wilderness.

Degradation of the wilderness resource by visitors.

Improper selection and use of campsites.

DESCRIPTION OF ACTION

Keep and enforce the no campfire policy in Paria Canyon.

Keep and enforce the pack-out litter policy.

Implement a pack-out toilet paper rule.

Require and enforce the utilization of established campsites.

Require the utilization of existing trails.

Require visitors to camp a minimum distance from other campsites.

PURPOSE

To reduce ecological impacts in the canyon and aesthetic impacts on the visitor.

IMPACT TO VISITORS

The results of the actions would positively affect the visitor's wilderness experience.

FUNDING/ STAFFING CONSIDER-ATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage for the proposed actions. To fully enforce the recommended actions, staffing would have to be increased. The utilization of volunteers could provide some relief for additional staff, but should not be considered as a substitution for hiring full-time staff.

IMPLEMENTATION

New restrictions and regulations could be implemented in the revised Paria Hiker's Guide, which is targeted for release in FY '91 or '92.

Develop displays for the new Paria Canyon - Vermilion Cliffs Wilderness Contact Station, which provide an educational and informative message on the rules and regulations of the canyon.

Have staff take immediate action to promote the rules and regulations of the canyon during visitor contact.

TACTIC 3: REQUIRE KNOWLEDGE OF WILDERNESS BEHAVIOR AND SKILLS

DESCRIPTION OF PROBLEM

Improper waste disposal, trailing, improper selection of campsites, trampling of vegetation have reached a level where they affect the quality of a wilderness experience.

DESCRIPTION OF ACTION

Prior to obtaining a permit, either one or all party members must show a basic knowledge of low-impact outdoor practices (limit to overnight users):

* Parties must fill out a questionnaire about low-impact practices and wilderness behavior. The questionnaire must be submitted to and approved by B.L.M. prior to the issuance of a permit or entrance into the canyon.

* Parties must supply or produce a certificate or proof of having attended classes or courses in low-impact skills or proper wilderness behavior.

* Parties must list books read on low-impact practices and proper wilderness behavior.

* Provide a video on low-impact camping practices at the Paria Ranger Station. Require unskilled visitors to view the video prior to hiking the canyon.

PURPOSE

Visitors' knowledge of low-impact skills would promote a reduction in adverse social and ecological impacts in the canyon. This tactic would prohibit unskilled visitors from entering the canyon and, thus, reduce detrimental use.

IMPACT TO VISITORS

The results of the recommended actions would positively affect the wilderness experience of those qualified to hike the canyon.

The recommended action would keep the unskilled visitor from experiencing the canyon. Also, it could be costly for unskilled visitors to acquire the skills needed to hike the canyon.

FUNDING/ STAFFING CONSIDER-ATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed actions. To fully implement the recommended actions would require an increase in personnel and wilderness funding. Additional staff support would be necessary to enforce the tactic of keeping visitors out of the canyon who do not possess the mandatory skills.

IMPLEMEN-TATION

This is a most drastic measure and would be implemented only when the "limits of acceptable change" are about to be met.

STRATEGY III. RESOURCE REHABILITATION AND RECLAMATION

TACTIC 1: REHABILITATE ESSENTIAL TRAILS, SCARIFY AND OBLITERATE NON-ESSENTIAL TRAILS

DESCRIPTION OF PROBLEM

Visitors have created and utilized multiple trails in the canyon which are close to degrading wilderness resource values.

DESCRIPTION OF ACTION

Physically scarify trails that are not essential to the visitor or that are adversely impacting the wilderness resource values. Rehabilitate trails essential to the visitor:

* Build sand ladders to prevent erosion (Wilderness Management Policy - minimum tool)
* Stabilize trails with rocks and natural materials found in the canyon
* Place eroded material onto trails determined non-essential and block access with rocks
* Implement other wilderness compatible methods to stabilize essential trails.

PURPOSE

To reduce adverse impacts on the wilderness resource and retain the natural features and pristine quality of Paria Canyon.

IMPACT TO VISITORS

The results of the action would positively affect the visitors' wilderness experience.

FUNDING/ STAFFING CONSIDER-ATIONS	Additional or increased funding would be necessary for acquiring required hand tools and supplies to perform the trail work. Volunteers, fire crews and low cost labor crews could be utilized for labor.
IMPLEMEN-TATION	These actions could be taken immediately as preventive measures.

TACTIC 2: CLOSE OFF CAMPSITES THROUGH INFORMATION DISSEMINATION

DESCRIPTION OF PROBLEM

Deterioration of lightly and moderately used campsites by increased visitor use.

Opportunities for visitors to experience solitude are impaired because campsites tend to be close to other campsites.

DESCRIPTION OF ACTION

Develop and distribute information on low-impact camping practices. In this information, encourage visitors to select hardened sites or mud terraces rather than utilizing lightly or moderately impacted campsites. Provide a detailed description of each. Verbally inform visitors at contact points about closed campsites:

* Resource Area Offices
* Trailheads
* Paria Contact Station

Provide visitors with a detailed map which depicts the closed sites or avoidable sites. Enclose this material in the pre-registration Paria Canyon informational packet. Make visitors aware of sites prior to their trip.

PURPOSE

Close campsites for the purpose of rehabilitating lightly and moderately impacted areas; reestablish vegetation and reduce or stop erosion.

Reduce crowding and conflicts with visitors by distancing campsites to less conspicuous locations.

IMPACTS TO VISITORS

The results of the action would positively affect the visitor's wilderness experience. These recommended actions could help visitors to develop lifelong low-impact habits and skills.

Some visitors may be inconvenienced by having less of a choice of where to camp.

FUNDING/ STAFFING CONSIDER-ATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed actions. To fully implement the recommended actions would require additional employees to ensure that visitors are contacted at the trailheads and Resource Area offices. Also, additional costs would be associated with the development and implementation of an outreach program to disseminate information.

IMPLEMEN-TATION

Managers should take immediate action to develop and initiate monitoring programs which will identify campsites.

The management action would be instituted when selected indicators established through the campsite monitoring program have been identified.

TACTIC 3: SIGNING OF CLOSED CAMPSITES AND TRAILS

DESCRIPTION OF PROBLEM

Degradation of wilderness resource values due to the increased use and creation of lightly and moderately impacted campsites or non-essential trails.

DESCRIPTION OF ACTION

Post signs at selected campsites and trails identified for closure:

* Develop and implement creative closure signs that blend in with the natural surroundings of the canyons. Construct signs that meet the "minimum tool" requirement of the Bureau of Land Management Wilderness Management Policy. An example would be to utilize a large piece of sandstone slab or rock with a symbol signifying "closure".

PURPOSE

Reestablish vegetation and stop erosion of campsites and trails. Restore identified campsites and trailed areas to their natural condition.

IMPACTS TO VISITORS

The results of the action would positively affect the visitor's wilderness experience. This recommended action is designed to maintain the wilderness resource values of the canyon.

Some visitors may be inconvenienced by having less of a choice of where to camp.

FUNDING/ STAFFING CONSIDERATIONS

Current staffing and wilderness funding are below standard and would not provide adequate coverage of the proposed action. To fully implement the recommended action would require an increase in personnel and funding for the wilderness program. Related additional costs would be adequate staff to enforce the closures. Volunteer groups could be utilized for the construction and placement of the signs.

IMPLEMENTATION

Develop and initiate monitoring program and select indicators.

This measure would be implemented when the implementation practices stated in Tactic 2 have not performed adequately. This tactic is designed to establish a physical presence of management within the canyon in order to improve compliance of the "closures".

CHAPTER V

DISCUSSION/CONCLUSION

In summarizing, it is important to restate that this project reflects my knowlege of the existing use in Paria Canyon. The results of the project which consist of the information dissemination schemes and the strategies and tactics, all reflect my interpretation of previous wilderness research, visitor registration comments, information from the Paria Canyon Study Summary, and wilderness legislation and regulations.

Therefore, it is important that the wilderness managers and specialists recognize that the information dissemination schemes, and strategies and tactics are all recommendations designed to aid management decisions and to protect the wilderness resource.

Managers should realize that only utilization, application and implementation of the recommendations will indicate whether or not the results of this project will prove to be effective.

Conclusion

The intent of this project is to make an initial effort to resolve the recreational problems in Paria Canyon by presenting information that will benefit managers, the wilderness user and the resource.

Recommendation

Recommendation 1. To effectively utilize the information dissemination schemes presented in this project, an overall marketing/interpretation plan needs to be developed for the Paria Canyon-Vermilion Cliffs Wilderness. This plan should set a direction and define objectives and goals.

Recommendation 2. Managers need to identify locations within the Resource Areas that can be substituted for Paria Canyon. Visitors who are seeking a recreational experience that is not dependent upon a wilderness setting should be targeted. Such an effort will entail the development of a screening process designed to identify these visitors.

Recommendation 3. For as much information as the Paria Canyon Study provides, it also raises many unanswered questions about the user and their use of the area. Who are the skilled and unskilled, and to what degree are they skilled? Are users attracted to the canyon for a social experience or for the environmental setting it provides? These are just two of many unanswered questions that could be addressed in future research, providing wilderness managers with additional insight into the wilderness visitor.

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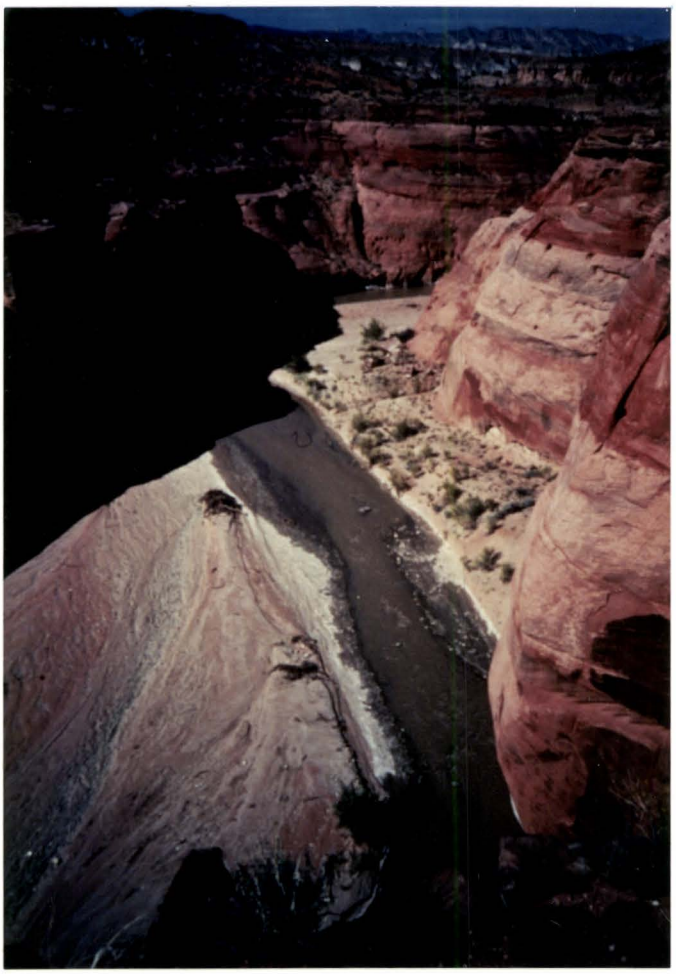
APPENDICES

Appendix A

Paria Canyon Photos

PARIA CANYON



Canyon Rim View

Inner Canyon

Cottonwood Terrace Campsite

Mud Terrace Campsite

Petroglyph Panel

HIGH IMPACT PRACTICES

Trailing at Campsite

Improper Waste Disposal

Campsite Fire Ring

Graffiti

Appendix B

1990 Paria Canyon Study Summary

1990 PARIA CANYON STUDY
SURVEY SUMMARY

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SUMMARY

The summary provides a condensed version of the 1989 Paria Canyon Study, which was developed by the Northern Arizona University Hospitality Research and Resource Center.

The material in the summary is taken verbatim from the study so as not to misconstrue the analysis or change the context of the responses.

The summary presents only the *low- and high-place attachment user group* respondents to the Paria Canyon questionnaire analyzed in the study. The low-place user represents those respondents who displayed a low attachment to the canyon and the high-place user respondents represent those who evidence a strong attachment to the canyon. These two distinct groups were selected for the summary as each group tends to view management problems and alternatives differently and, thus, provide two differing perspectives.

The *significance levels* indicated in the summary are presented with an asterisk next to the corresponding response. This significance level simply indicates an assessment of the level of confidence that the difference between the two groups is not simply the result of a sampling error (Combrink and Parker 1989). At a .01 level, the confidence level is high.

The *observation statements* that were formulated in the study have been integrated into the summary. These statements provide explanations about discrepancies in the responses and proposed management solutions.

1990 PARIA CANYON STUDY
SURVEY SUMMARY

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE

I. LITTER AND WASTE
(indication of increased use)

1. Litter in the canyon as a <u>problem</u>
   L - 50%
   H - 50%

2. Litter at campsites as a <u>problem</u>
   L - 62.2%
   H - 73.7% *.01

Observation: The greater stress placed by respondents on litter at campsites may be attributable to the congested conditions and concentrated high use in the camping areas.

3. Evidence of toilet paper at campsites as a <u>problem</u>
   L - 50.0%
   H - 47.4%

4. Toilet sites noticeable as a <u>problem</u>
   L - 54.3%
   H - 63.2%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
5.	Encroachment of toilet sites on campsites a <u>problem</u> L - 50% H - 63.2% *.05	
6.		<u>Oppose</u> having toilets in the canyon L - 42.5% H - 50.0%
7.		<u>Favor</u> more restrictions on disposal of human waste L - 50.0% H - 70.0%
8.		<u>Favor</u> more information on disposal of human waste L - 51.3% H - 76.5% *.01

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE

II. CAMPSITE COMPETITION AND DEGRADATION (correlated to high use periods and party size)

9. Signs of overuse at campsites as a <u>problem</u>
   L - 51.4%
   H - 78.9% *.01

10. Limited number of campsites due to environmental conditions as a <u>problem</u>
   L - 44.4%
   H - 50.0%

Observation: The lack of consensus attached to the environment as a limiting factor may relate to an awareness of the fact that in a canyon, there are only a certain number of prime campsites.

11. Availability of campsites due to competition with other users as a <u>problem</u>
   L - 51.4%
   H - 42.1%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE

Observation: The difference in opinion may be the result of the time of the year that the various groups traveled, i.e., low or high intensity of visitation, party size, and prior perceptions of a wilderness experience. Possible that respondents with diminished expectations do not perceive crowding and competition as serious problems because they are pre-conditioned to them.

12. Vandalism (natural and cultural resources) as a <u>problem</u>
    L - 31.4%
    H - 45.0% *.05

13. Evidence of fire rings at campsites as a <u>problem</u>
    L - 50.0%
    H - 68.4% *.01

14. Physical impact of other groups or parties as a <u>problem</u>
    L - 67.7%
    H - 85.0% *.05

Observation: The degree to which the problem is considered severe may have a potential correlation to the desired wilderness experience as well as prior wilderness experiences and knowledge.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
15.		In <u>favor</u> of not allowing campfires in the canyon L - 58.5% H - 63.2%
16.		<u>Favor</u> the use of firepans in the canyon L - 27.5% H - 15.0%
17.		In <u>favor</u> of closing campsites to allow recovery L - 50.0% H - 60.0%

Observation: This disparity may be a reflection of the difference in wilderness expectations between the two user groups where the low place attachment groups does not see the need to close down or rest a site.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
	18.	Oppose developing formal campsites to minimize impacts L - 68.5% H - 60.0%

III. RESOURCE DEGRADATION

19. Erosion along trails as a problem
L - 16.2%
H - 42.1%

Observation: The low incidence of identification of the problem may be due in part to the rugged topography and the rocky trail systems which do not tend to show erosion as severely as sandy soils, beach sites, and river benches.

20. Multiple trails near campsites as a problem
L - 32.4%
H - 73.7% *.01

21. Presence of cattle in the canyon as a problem
L - 44.7%
H - 47.4%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
22.	Signs (dung, hoofprints) of cattle in the canyon as a noticeable problem L - 52.6% H - 52.6% *.01	
23.	Signs of cattle at campsites as a problem L - 41.7% H - 42.1%	
24.		In favor of removing cattle from the canyon L - 64.3% H - 65.0% *.01
25.		Oppose fencing to keep cattle out of the canyon L - 51.1% H - 50.0%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
IV. RULES AND REGULATIONS (no differentiation for types of rules)		
26.	Problem because of too few rules and regulations L - 16.2% H - 26.3% *.05	
27.	Insufficient law enforcement in the canyon L - 11.4% H - 15.8%	
28.		In favor of providing more information about rules and regulations in the canyon L - 64.1% H - 55.0% *.01

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
	29.	Oppose reducing rules and regulations L - 20.0% H - 55.0% *.05
	30.	In favor of requiring a permit to enter the canyon L - 46.4% H - 40.0%

Observation: Traditionally, those visitors with high place attachment values have been opposed to a permit system but may be in favor of a system that controls use and insures the integrity of a wilderness experience.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE

V. BEHAVIORAL AND INFORMATION RELATED PROBLEMS ("careless, unskilled and uninformed actions")

31. Other visitor behavior as a problem
L - 29.7%
H - 15.8%

Observation: Caveat regarding the response: 1)Question not specific in pinpointing what constituted adverse visitor behavior. 2)The high use of the canyon and its popularity may well have already led to the displacement of those wilderness users who would find other visitors' actions and behavior offensive in a wilderness setting.

32. Lack of information on appropriate behavior in a wilderness setting as a problem
L - 25.7%
H - 10.5% *.01

Observation: The hypothesis that low place attached individuals would tend to have less knowledge or understanding about wilderness ethics and behavior is supported in part by this data.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
33.	Lack of signs in the canyon is a problem L - 16.2% H - 35.5%	
Observation:	The hypothesis that the place attached groups would desire different levels of signage did not hold according to the data collected.	
34.		Oppose the use of directional signs in the canyon L - 75.0% H - 50.0%
35.		Oppose the introduction or use of interpretive signs in the canyon L - 80.0% H - 65.0%
36.		Oppose the use of directional signs for major attractions in the canyon L - 69.2% H - 55.6%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
	37.	Favor more information about the canyon and its features L - 61.5% H - 65.0%
	38.	Favor management techniques which provide information on appropriate behavior designed to minimize visitor impacts upon the canyon L - 75.0% H - 85.0% *.01
	39.	Favor implementing a required education program to show knowledge of appropriate behavior in the canyon L - 18.5% H - 30.0% *.01
	40.	Favor providing more information about drinking water in the canyon L - 55.2% H - 85.0%

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
VI. MANAGEMENT TECHNIQUES TO CONTROL DENSITY AND PRESERVE EXPERIENCE		
	41.	Favor limiting number of people entering the canyon per day L - 53.8% H - 50.0%
	42.	Favor limiting number of groups that enter the canyon per day L - 60.0% H - 65.0% *.01

Observation: This is consistent with the hypothesis concerning the desired wilderness experience of high place attached individuals. High place attached respondents are more affected by contact with large groups than small groups or individuals.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
	43.	<u>Favor</u> limiting the maximum group size to ensure that the wilderness experience is enhanced L - 75.0% H - 80.0% *.01
	44.	<u>Oppose</u> assigning campsites to relieve the negative stress of crowding in the canyon L - 84.6% H - 95.0%

Observation: No other management technique in the questionnaire received such unanimous disapproval as the assignment of campsites. Respondents appear to rate this technique so unfavorably because it places too much control over itinerary and possible wilderness experience in the hands of the management agency.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

CATEGORIES	PROBLEM QUESTION/ RESPONSE	MANAGEMENT SOLUTION QUESTION/RESPONSE
	45.	<u>Favor</u> restricting the number of visitors during certain periods of heavy use L - 65.0% H - 63.2%

Observation: This technique may prove to be the most effective density control mechanism since peak use and crowding combined with diminished wilderness expectations are usually concomitant.

L = LOW SENSE OF PLACE ATTACHMENT GROUP RESPONSE
H = HIGH SENSE OF PLACE ATTACHMENT GROUP RESPONSE
* = SIGNIFICANCE LEVEL

GRAPHS

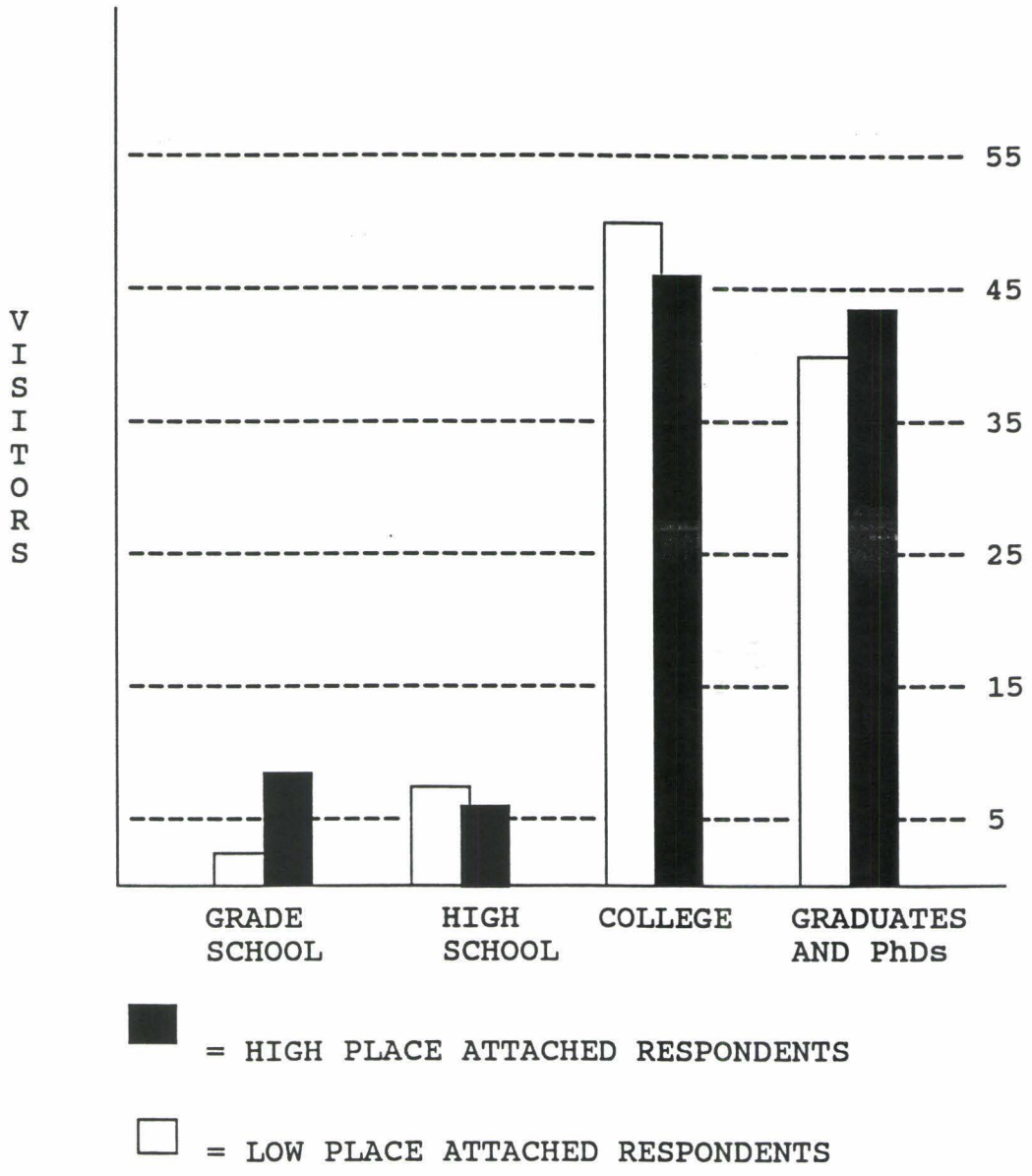

Figure 1. User Education Levels

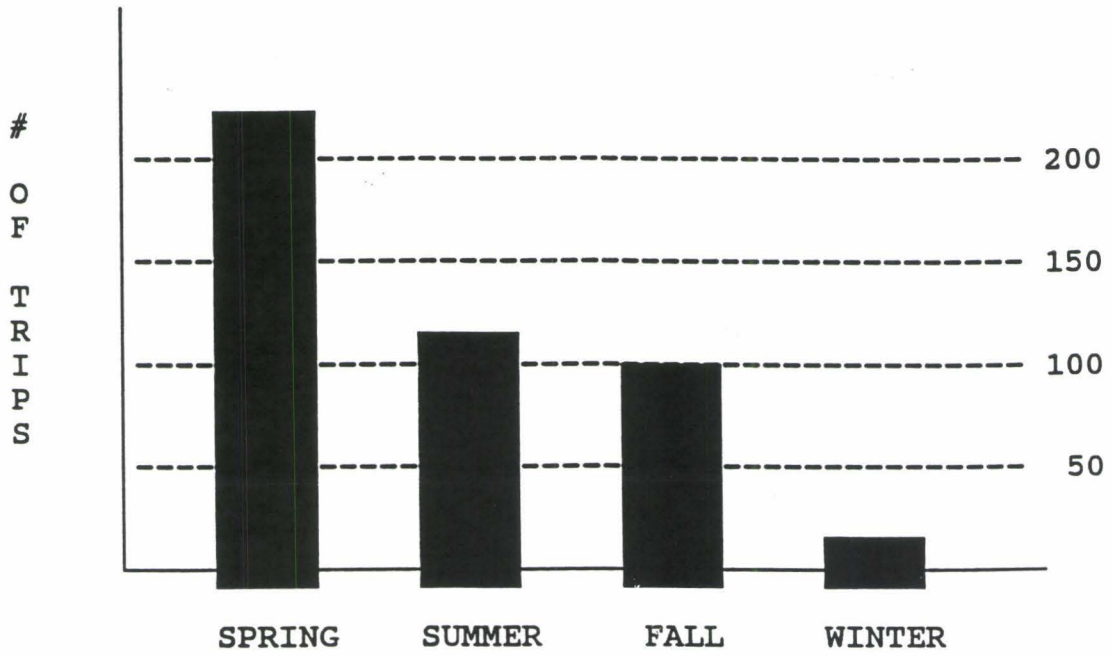

Figure 2. Season of Use

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